

S.N. 09/963,933 Page 2

LISTING OF CLAIMS

1. (Previously amended) A magnetic tunnel junction comprising:
a data layer having a magnetization that can be oriented in first and second directions;
an unpinned synthetic ferrimagnet reference layer; and
an insulating tunnel barrier between the data layer and the reference layer.
2. (Original) The device of claim 1, wherein the data layer has a higher coercivity than the reference layer.
3. (Original) The device of claim 1, wherein the reference layer includes first and second ferromagnetic layers separated by a spacer layer, the first and second ferromagnetic layers having different coercivities.
4. (Original) The device of claim 3, wherein the spacer layer is electrically conductive and magnetically non-conductive.
5. (Original) The device of claim 3, wherein the coercivity of the reference layer is determined by the ratio of thickness of the first and second ferromagnetic layers.
6. (Original) The device of claim 3, wherein magnetic moments of the first and second ferromagnetic layers substantially cancel out.
7. (Previously amended) A magnetic memory device comprising:

S.N. 09/963,933 Page 3

a data layer having a magnetization that can be oriented in first and second directions;
a synthetic ferrimagnet reference layer, the data and reference layers having different coercivities;
a first conductor on the reference layer;
an electrical insulator on the first conductor; and
a second conductor on the insulator.

8. (Previously amended) The device of claim 7, further comprising a third conductor in contact with the data layer, the third conductor being orthogonal to the first conductor.
9. (Original) The device of claim 1, further comprising a first conductor in contact with the data layer, and a second conductor in contact with the reference layer, the first and second conductors being orthogonal.

Claims 10-11 (Cancelled)

12. (Previously amended) The device of claim 1, further comprising a ferromagnetic cladding for the reference layer.

Claims 13-17 (Cancelled)

18. (Previously amended) An information storage device comprising an array of memory cells, each memory cell including at least one magnetic tunnel junction, each magnetic tunnel junction including a data layer and a soft ferrimagnet reference layer, the data and reference layers having magnetizations that can be switched between first and second directions during write operations, only the

S.N. 09/963,933 Page 4

reference layer being switchable between first and second directions during read operations.

19. (Previously amended) The device of claim 18, wherein each reference layer includes first and second ferromagnetic layers separated by an electrically conductive and magnetically non-conductive spacer layer.
20. (Previously amended) The device of claim 19, wherein reference layer coercivity is determined by the ratio of first ferromagnetic layer thickness to second ferromagnetic layer thickness.
21. (Previously amended) The device of claim 19, wherein magnetic moments of the first and second ferromagnetic layers of a ferrimagnet reference layer substantially cancel out.
22. (Cancelled)
23. (Previously added) The device of claim 18, further comprising pluralities of word and bit lines for the array of memory cells; and a plurality of read lines for the memory cells.